Introduction

The final project is the most important aspect of the course. Your goal is to study a problem in computer vision in some detail, including analysis of the problem and potential solutions, implementation of one or two solutions, and analysis of the results. Your project must involve some research into the literature and some implementation. You may use existing implementations that you find on-line, and you are encouraged to do so since it will increase the sophistication of what you can accomplish. You will be judged, however, on what you do yourself, so using existing implementations should not be viewed as a substitute for your own effort.

Often the most interesting projects involve applications of computer vision that students dream up on their own. Matching puzzle pieces is one simple example. You should use your imagination in developing your topic. On the other hand, I am not asking you to do substantial original research, so that a large part of your project can be the implementation and analysis of existing computer vision techniques. You are welcome to consult with me about project ideas, and I strongly encourage you to do so.

Submissions

There are multiple submissions and due dates for this project. In each case, no extensions will be given without an excuse from the Dean of Students office. Moreover, I reserve the right to request refinement of the first two submissions before accepting them for credit.

- **Wednesday, November 10th, 12 noon — Initial proposal:** Provide a one-to-two paragraph overview of the problem you are addressing and the techniques you are going to use to solve the problem. This must include an outline of (a) the software you have found (if any) to help you address the problem, and (b) your source(s) of image or video data.

- **Monday, November 29th, 12 noon — Progress report:** Provide a one or two page summary of your progress thus far, including an outline (with references) of the literature you have read, the approach you are taking to solve the problem, and the current state of your implementation. If you have found new sources of software to assist you or new images to test, you should outline these here.

  **Note:** You are strongly encouraged to submit your initial proposal and your progress reports early. Feedback will be given within 24 hours. You are also encouraged to seek my help with ideas, project scope and technical issues on their projects before these deadlines.

- **Thursday, December 9th — Oral Presentations:** Each student enrolled in the graduate-level version of the course will give a Pecha-Kucha (http://www.pecha-kucha.org/) presentation of their project. These are timed powerpoint presentations with 20 slides and 20 seconds per slide. The presentation should summarize (a) the problem begin addressed, (b) why it is interesting / important, (c) the main idea(s) of the solutions, (d) the implementation, and (e) the results.
The challenge of making this presentation is finding the right level of technical depth. A random ordering of students will be given at the start of class, so each presenter should arrive in class fully prepared.

- **Monday and Tuesday, December 13 and 14 — Demos:** Students will have 15-minute time slots to demonstrate their final projects. You should arrive at my office (Materials 331B) with your laptop ready to run your software. On Monday, December 6, in class, students choose time slots for their demos.

- **Tuesday, December 15, 3pm — Final code and paper submission:** Final write-up and code due in my office. The write-up should be roughly 10 pages (including figures!), single-spaced, 12-point font, printed and handed to me. It should describe the problem, the algorithm, the data, the implementation and the results. Importantly, it should conclude with an analysis of the strengths and weaknesses of the solution, tying the analysis to properties of the image data as carefully as possible.

If you would like to do your final demo before the 13th, you are welcome to arrange a time with me.

**Grading Criteria**

Here is a break-down of the point assignment. These points do not carry the same weight as points assigned to regular homeworks.

<table>
<thead>
<tr>
<th>Submission</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial proposal</td>
<td>10</td>
</tr>
<tr>
<td>Progress report</td>
<td>25</td>
</tr>
<tr>
<td>Presentation (grad only)</td>
<td>40</td>
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<tr>
<td>Demo and final submission</td>
<td>100</td>
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</tbody>
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Grades on the proposal and on the progress report will be based primarily on establishing a good direction and getting off to a good start. The grade on the presentation will be based primarily on interest and clarity. For the demo and final submission, I will be judging your effort, clarity, originality, thoroughness and insight.